PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 2002P00137 WO	**FOR FURTHER ACTION**	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/EP 03/09832	International filing date *(day/month/year)* 04.09.2003	Priority date *(day/month/year)* 09.09.2002
International Patent Classification (IPC) or both national classification and IPC G06F17/30		
Applicant SAP AKTIENGESELLSCHAFT et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 8 sheets, including this cover sheet.

   ☒ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of 6 sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
23.02.2004	19.11.2004
Name and mailing address of the international preliminary examining authority: European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Huber, A Telephone No. +49 89 2399-2041

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP 03/09832

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1-18	as originally filed

Claims, Numbers

17	as originally filed
1-16	received on 28.09.2004 with letter of 22.09.2004

Drawings, Sheets

1/9, 3/9-5/9, 7/9-9/9	as originally filed
2/9, 6/9	received on 28.09.2004 with letter of 22.09.2004

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

   ☐ the language of publication of the international application (under Rule 48.3(b)).

   ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   ☐ contained in the international application in written form.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority in written form.

   ☐ furnished subsequently to this Authority in computer readable form.

   ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   ☐ the description, pages:

   ☐ the claims, Nos.:

   ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	1-16
	No:	Claims	
Inventive step (IS)	Yes:	Claims	
	No:	Claims	1-16
Industrial applicability (IA)	Yes:	Claims	1-16
	No:	Claims	

2. Citations and explanations

see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. The application does not meet the requirements of Article 6 PCT, because claims 1-16 are not clear.

1.1. The description explains (Figures 3, 4 and 5 and page 13 of the description) three concurrently running modules and concurrent software applications. Said three modules are a selecting module, a writing module and a deleting module, whereby said selecting module and said writing module can be combined into one module. Any interference between said modules and said concurring software applications are prevented by the use of two locks, i.e. the T-lock (Transactional lock) and the P-lock (Permanent lock), dealing with two separate tasks. The T-lock is represented in claim 1 by the second type ID/second lock object and the P-lock is represented by the first type ID/first lock object (Source: page 11 line 6 ff).

The T-lock blocks data objects for one transaction, i.e. one action to be performed, and thereby ensures that the concurrently running modules and the software applications do not interfere.

The P-lock blocks data objects for the purpose of archiving, preventing other software applications from accessing or modifying the data objects, i.e. the P-lock marks data objects for being archived (and tells the deleting module to delete said data object). Furthermore, the fact that an archive file is assigned to the P-lock defines that the data object is archived (claim 4, Figure 8 & p.16 l.18 - p.17 l.6). Moreover, a software application, needing to modify a data object, can remove the P-lock as long as said data object is not yet archived (i.e. no archive file is yet assigned to the P-lock; from Figure 8).

It is understood from Figure 8 and from page 16 line 18 - p.17 l.6 of the description that the writing module assigns an archive file to the P-lock, and thereby it defines that the data object is archived. Then no software application can modify said data object any more. If, however, a P-lock is set but no archive file is assigned to it (i.e. the selection module selected said data object for

archiving, but said data object is not yet archived), then the software application can still modify the data object and delete it from the P-lock.

Now, it is understood from claim 1 that the steps a to g are sequentially executed, one after the other. Having this in mind, the conditions in steps f and g do not make sense. Are some steps executed in parallel? If yes, which are those, and how are they executed?

Considering what has been said above, claim 1 is not clear and it does not meet the requirements of Article 6 PCT.

1.2. Claims 2-12, dependent on claim 1, do not remedy the lack of clarity of claim 1 and are consequently also not clear. Claims 13-16 are likewise not clear.

1.3. Claim 5 should say step b instead of step c, otherwise it is not clear. Similarly, claim 8 should say in its last line step c instead of step d.

2. The following documents (D) are referred to in this communication; the numbering will be adhered to in the rest of the procedure:
D1: STEFANI H.: "Datenarchivierung mit SAP" May 2002 (2002-05), SAP PRESS, GALILEO PRESS , BONN , XP002266517 ISBN: 3-89842-212-7
D2: US-A-5 566 319 (LENZ NORBERT) 15 October 1996 (1996-10-15)
D3: EP-A-0 499 422 (IBM) 19 August 1992 (1992-08-19)

3. The document D1, which seems to be the most pertinent prior art document available, discloses:
the designating of data objects ("Löschvormerkung" and "Löschkennzeichen", p.37-38) for archiving (part of steps a and c of claim 1),
the archiving of said designated data objects in new created archive files (step d of claim 1),
and deleting said archived objects in the first storage location by reading/verifying the new created archive files ("Probelesen", p.65-66 and p.72).

Claim 1 differs from the teachings of D1 in that it stores the ID of a data object in a second lock object (the T-lock) (step b of claim 1), and in that it deletes the T-lock

earliest at a time at which the P-lock on said data object has been set (step g). Furthermore, claim 1 differs from D1 in that data objects which are stored in the P-lock are deleted (step e), and after that, that the P-lock for the deleted data object is also deleted (step f).

Concerning the differences as to the T-lock, by means of these differences claim 1 appears to solve the objective technical problem of how to consistently set the P-locks.
Now, it is notorious practise in the art to use transactional locks for blocking data objects when concurrently working modules try to access the same data objects in order to ensure data consistency in this parallel working environment. The second lock object (the T-lock) used in claim 1 blocks a data object until the P-lock for said data object has been set (in order to ensure that the concurrently running modules and the software applications do not interfere).
Hence, this relates to the standard, commonplace, straight-forward use of transactional locks, and is a matter of normal design procedure. Its inclusion would therefore be an obvious design possibility for the skilled person in order to solve the problem posed.

Concerning the difference as to the deletion of data objects, by means of these differences claim 1 appears to solve the objective technical problem of how to provide an alternative way of determining the data objects to delete. Now, to select those data objects which are stored in the first lock object is a one of several, straight-forward possibilities, from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill, in order to solve the problem posed.
Furthermore, to delete the P-lock for the deleted data object is also a straight-forward option, the skilled person would implement, in accordance with circumstances, without the exercise of inventive skill, in order to solve the problem posed.

Hence, the solution proposed in claim 1 of the present application does not involve an inventive step (Article 33(3) and Rules 64 and 65 PCT).

4. The features added by the dependent claims 2-12 are either known from D1 or form part of the general knowledge of the person skilled in the art. They do not

appear to comprise anything which would go beyond the prior art to an extend that it could be considered as involving an inventive step.

5. In particular concerning the subject-matter added by claim 3:
The first lock object, the P-lock is not a lock or semaphore as such but it is an archive table (archive register, archive flag). Identifiers of data objects are put in said P-lock/archive table (see Figure 2 of the application) to indicate that said data objects are to be archived or that they have already been archived.

To use such an archive register (i.e. "Löschkennzeichen" with archive link) is a notorious and one of several straight-forward solutions from which the skilled person would select, in accordance with circumstances, without the exercise of inventive skill, in order to solve the problem posed.
A similar dedicated lock file is disclosed e.g. in D2 (e.g. at the abstract), and also in D3 (p.3 l.7 and l.25-26).

6. What has been said above with reference to claims 1-12 also applies to claims 13-16, mutatis mutandis.

7. Final Remarks

7.1. The sentence on page 15 line 12-13 seems to be wrong and should be deleted. On page 12, the last paragraph does not seem to be clear.

7.2. The vague generalising expression spirit in the description at page 18, line 10, brings into doubt the subject matter for which protection is actually sought, and should therefore be deleted.

7.3. The independent claims are not in the two-part form in accordance with Rule 6.3(b) PCT.

7.4. The summary of the invention should explicitly refer to the independent claims and mention their category.

7.5. International applications PCT/EP03/09833, PCT/EP03/09831, PCT/EP03/09827

and PCT/EP03/09830 are four co-pending international applications from the same applicant designating the same States and the claims of those applications have the same priority date and relate to the same invention (even though they may not necessarily claim that invention in identical terms). According to the PCT Guidelines Part III Chapter 11.10, it is noted to the applicant that each conflicting application might raise possible double patenting issues, as it is an accepted principle in most patent granting systems that two patents shall not be granted to the same applicant for one invention.

What is claimed is:

1. A method for moving data objects (201.x) in a computer system (101) from a first (107) to a second (108) storage location, comprising:
a) selecting one or more data objects (201.x) having an identifier (ID) from the first storage location (107) (301),
b) storing said ID in a second lock object 204) (302),
c) in case step b) has been performed successfully: storing said ID in a first lock object (203) (307),
d) storing a data object (201.x), the ID of which is contained in the first lock object (203), at the second storage location (108) (405),
e) deleting a data object (201.x), the ID of which is contained in the first lock object (203), from said first storage location (107) (502),
f) deleting an ID from the first lock object (203) earliest at a time at which step e) for the respective data object (201.x) assigned to that ID has been completed (503),
g) deleting an ID from the second lock object (204) earliest at a time at which step c) for a particular ID has been completed (308).

2. The method of claim 1, wherein a data object comprises one ore more fields of one or more tables (201, 202) and wherein the ID comprises one or more key fields of the one or more tables (201, 202).

3. The method of claim 1 or 2, wherein in step d) the data objects (201.x) are stored in one or more files (405) and wherein an assignment of the ID to the file or to a name of the file, in which the data object assigned to said ID is

which the data object assigned to said ID is stored, is stored in the first lock object (203) (408).

4. The method of one of claims 1 to 3, wherein the first lock object (203) is stored on a nonvolatile storage means (107).

5. The method of one of claims 1 to 4, wherein in step c) the ID is stored in the second lock object (204) immediately after performing step a) for the respective data object (201.x).

6. The method of one of claims 1 to 4, wherein in step b) the ID of the selected data object (201.x) is stored in the second lock object (204) shortly before the storing process according to step d) for the data object (201.x) assigned to that ID is started.

7. The method of one of claims 1 to 6, wherein in step c) the IDs of all selected data objects (201.x) are stored in the first lock object (203) before the first storing process according to step d) is started.

8. The method one of claims 1 to 7, further comprising:
h) checking before or while performing any of steps a) to c) for a data object (201.x), whether an ID for the data object (201.x) has been stored in a first lock object (203), and if yes, skipping at least step d) for that data object (201.x).

9. The method of one of claims 1 to 8, further comprising:
i) checking before or while performing any of steps a) to d) for a data object (201.x), whether that

data object (201.x) is contained in the second storage location (108), and if yes, skipping at least step d) for that data object (201.x).

10. The method of claim 9, wherein said checking step i) is performed by querying a first lock object (203).

11. The method of one of claims 1 to 10, further comprising:
j) in case of a failure in step d) checking, whether the data object (201.x) assigned to the respective ID has been completely stored in the second storage location (108), and in case of no, skipping at least steps e) and f) for that data object (201.x) and deleting the ID from the first lock object (203).

12. The method of one of claims 1 to 11 for use in an enterprise resource planning software.

13. A computer system (101) for processing data by means of or in a software application (111), comprising:
- memory (112) for storing program instructions;
- input means (102, 104, 113) for entering data;
- storage means (107, 108) for storing data;
- a processor (105) responsive to program instructions
- program instructions to carry out a method as of any of claims 1 to 12.

14. A computer program comprising program code means for performing a method as of any of claims 1 to 12 if said program is executed on a computer system.

15. A computer readable medium comprising program code for performing a method as of any of claims 1 to 12 if said program code is executed on a computer system.

16. A computer program product comprising a computer readable medium according to claim 15.

Table 1

201

Field A	Field B	Field C	...	Field X
A	B			
B	B			G
B	C			
C	F			
...	...	...	...	...

201.x

203

Permanent Lock Object

ID 1	Archive
AB	001
BB	002
BC	002
CF	003
...	...

Table 2

202

Field A	Field B	Field C	...	Field Y
E	L			
F	K			
G	H	M		to Table ...
C	F			
...	...	...	...	...

Transactional Lock Object

204

ID 2
AB
BC
CF
...

Fig. 2

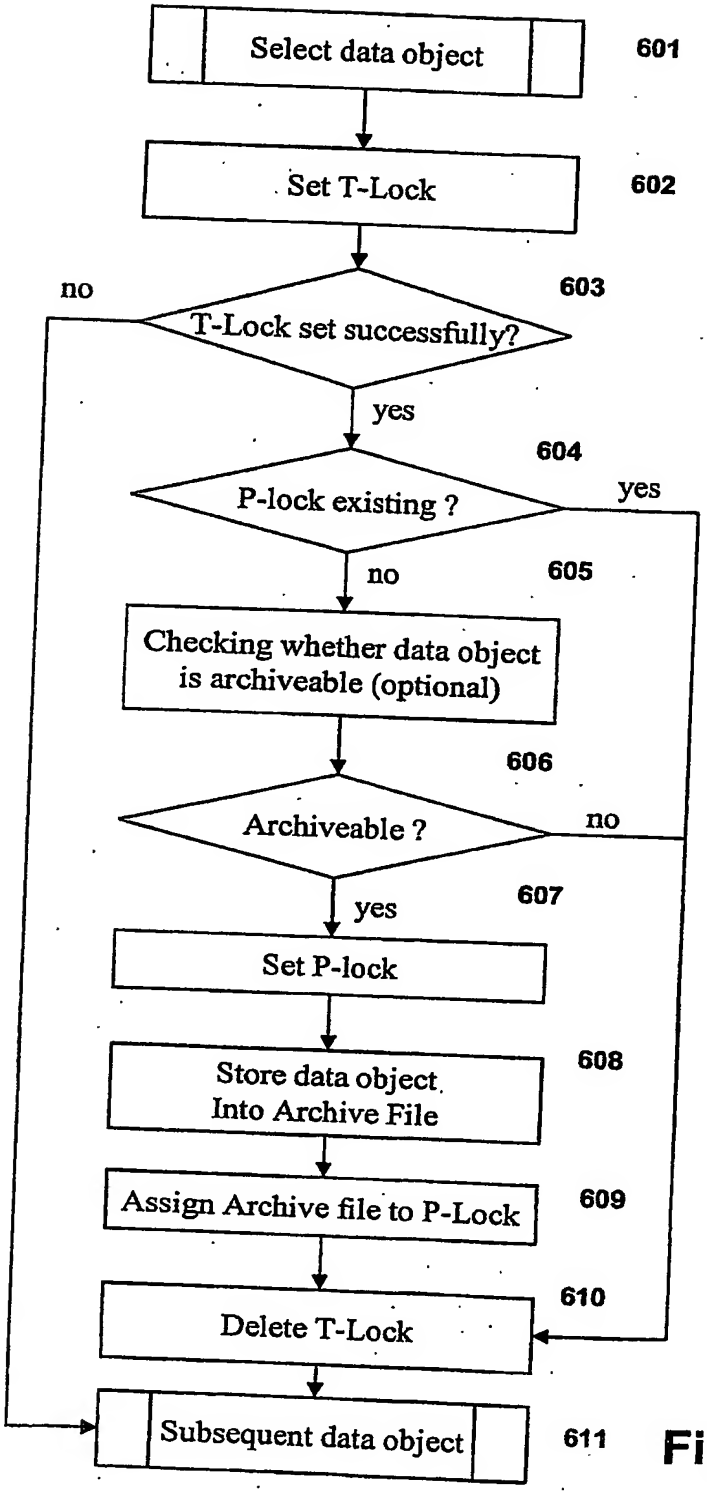
Select data object
601
Set T-Lock
602
no
603
T-Lock set successfully?
yes
604
P-lock existing ?
yes
no
605
Checking whether data object is archiveable (optional)
606
Archiveable ?
no
yes
607
Set P-lock
Store data object Into Archive File
608
Assign Archive file to P-Lock
609
Delete T-Lock
610
Subsequent data object
611

Fig. 6